Amendments to the Specification:

Please amend paragraph [0031] on page 8 to read as follows:

[0031] Figure 2 illustrates in greater detail an embodiment of the method of the invention. Various process metrics such as maintenance data **205**, trace process data **210**, output data **215**, and odometry data **220** are collected over time. Maintenance data **205** may include, for example, the elapsed time since the last maintenance activity. The data is then transformed (according to one or more transformations **225**) into a common, merged record format **230** by averaging, filtering, or grouping individual statistics. Using the merged records **230**, a neural network **235** may then be trained on the relationship between the maintenance and process data **205**, **210**, and **220** and process output metrics, thereby producing, for a set of input data, a set of predicted results **240**.

Please amend paragraph [0037] on page 10 to read as follows:

[0037] When a maintenance action is required in response to a gradual pattern of wear-out and is one to which the neural network has not previously been exposed, signs of its declining fitness for use may be visible in sensed process parameter flows or by in-situ sensors. ~~The~~ An optimizer **250** identifies these parameters **245** (manipulated variables) as needing adjustment in an intermittent pattern of low urgency at first, followed by an increased frequency and larger urgency values as time proceeds. The growth in frequency and magnitude of the urgency metric may be seen across all recipes, indicating an intrinsic time-based problem rather than a process-parameter set-point problem. While the appropriate maintenance action is not explicitly identified because the neural network has never trained on this type of action, the network nonetheless narrows the scope of the parts, sensors, or calibration actions that represent potential solutions **255**.

Please amend paragraph [0067] on page 20 to read as follows:

[0067] For each proposed maintenance action option, the predicted individual risk values for each process parameter are calculated, as well as a predicted overall cost value for performing the action. For example, Option 1 represents the predicted risk values **322**, **324**, **326**, **328**, **330**, and **332** of each of the six process parameters I-VI, and a predicted total cost value **335**. Option 2 represents risk values of each of the same six process parameters, but with different predicted risk values **342**, **344**, **346**, **348**, **350**, and **352** based on performing different maintenance activities, and a predicted total cost value **355**. The same representative information is displayed for Option 3 (**362**, **364**, **366**, **368**, **370**, and **372**) and Option 4 (**382**, **384**, **386**, **388**, **390** and **392**). The predicted cost values (**335**, **355**, **375**, and **395**) for each of the four options are compared, and the option providing the lowest predicted cost is selected such that the proposed maintenance actions are then performed. In the example of Figure 3, Option 1 provides a predicted cost of 412, which is lower than the predicted costs for Option 2 (447), Option 3 (451), and Option 4 (452) and therefore the maintenance actions represented by Option 1 are performed.

Information Disclosure Statement

With this Amendment, Applicants also submit a replacement copy of previously cited reference B1.

Conclusion

Applicants thank the examiner for the favorable examination and allowance of claims 1 – 18. Applicants respectfully submit that the above amendments conform with the guidelines of 37 C.F.R § 1.77(b), and further bring the drawings into compliance with 37 C.F.R. § 1.84(p)(5). These changes represent no substantive amendment to either the specification or claims as originally drafted and submitted. No new material has been added.

The Examiner is invited to contact Applicants' undersigned representative by telephone at the number listed below to discuss any outstanding issues.

Respectfully Submitted,

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